



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

MAY 02 2018
MAY 02 2018

D412-702-021
Job Sheet 176836



003138

Part No: D412-702-021

Job Qty: 1 ea

Part Name: Shoulder Harnesses, 4 Point Attachment, 13 Man Configuration

MAY 10 2018



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 5/2/18

Job Tracking No:

Due Date: 5/30/18

Created By: Linda Lacelle

Type: SOLD

Description:

Note: DWG IIN-D412-702-1 REV A SHEET 20, DSI9559 REV A, DSI9766 REV A IPP Rev:B Removed
Manufacturing 05-11-08 JLM IPP Rev:C IPP rev D 06.12.14 per ecn 871 EC IPP Rev:E 07-03-14 As per DSI
9351 JLM IPP Rev:F 07-07-28 As per Rev E JLM Verified By:ec IPP Rev.G 11.05.31 DSI 9559 EC verified
by:JLM IPP REV:H 17.03.13 AS PER DSI9766-011 DD VERF:JFS

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea		5/30/18	0.00	0.00	Start Up Stores/Pkg-2		5/10/2018
110	Packaging	1 pcs		5/30/18	0.00	0.00	Packaging1-4		MAY 31 2018
120	QC	1 pcs		5/30/18	0.00	0.00	QC4		MAY 31 2018
125	DC	1 pcs		5/30/18	0.00	0.00	DC		
130	Packaging	1 pcs		5/30/18	0.00	0.00	Packaging3-2		MAY 31 2018
140	QC21-FG	1 Ea		5/30/18	0.00	0.00	QC21		

DAS
21
9-89

MAY 31 2018



Container No: S076702



Part: D412-702-021

Job No: 176836

Serial No/Batch: S076702

Revision:

Inspector:

Exp Date: 05/31/2018

Instructions:

Date: 05/31/18

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
CANADA
TEL.: 1 613 632-5200
Email: sales@dartaero.com
www.dartaerospace.com

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : _____					

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
AN4-13A	Bolt	4 Ea (4 ea)	90-Start up Operation	5054119
AN4-20A	Bolt	8 Ea (8 ea)	90-Start up Operation	56171061
AN4-5A	Bolt	4 Ea (4 ea)	90-Start up Operation	5027725
D3195-041	Bracket	2 Ea (2 ea)	90-Start up Operation	5053802X1
D3195-043	Bracket	2 Ea (2 ea)	90-Start up Operation	5053803
D3196-1	Bar	1 Ea (1 ea)	90-Start up Operation	F163000
D3196-3	Bar	1 Ea (1 ea)	90-Start up Operation	F163001
D3196-4	Bar	1 Ea (1 ea)	90-Start up Operation	F163002
D3197-041	Bar	2 Ea (2 ea)	90-Start up Operation	501488
D3198-1	Fitting	4 Ea (4 ea)	90-Start up Operation	504218 5023586 *
D3268-1	Placard	2 Ea (2 ea)	90-Start up Operation	5027133X1 F164410X1
D3546-1	Clip	2 Ea (2 ea)	90-Start up Operation	5053808
D3551-11	Hook And Loop Tie	13 Ea (13 ea)	90-Start up Operation	5053809X5 5059559X8 ✓
D412-702-069	Grommets	1 Ea (1 ea)	90-Start up Operation	5053798
D4387-041	Harness Assembly	9 Ea (9 ea)	90-Start up Operation	5036158X3 5055583X6
D4387-043	Harness Assembly	4 Ea (4 ea)	90-Start up Operation	5036147
D5474-1	Spacer	6 Ea (6 ea)	90-Start up Operation	5011372
D5475-1	Anti Chafing Shield	1 Ea (1 ea)	90-Start up Operation	5025205
D5475-2	Anti Chafing Shield	1 Ea (1 ea)	90-Start up Operation	5023368
MS21042L4	Nut	12 Ea (12 ea)	90-Start up Operation	5056039
MS24694-S152	Screw	8 Ea (8 ea)	90-Start up Operation	5053800X2 F1137361X6
MS24694-S154	Screw	8 Ea (8 ea)	90-Start up Operation	5016893X4 5053801
MS24694-S162	Screw	6 Ea (6 ea)	90-Start up Operation	5005132
NAS1149D0463J	Washer	20 Ea (20 ea)	90-Start up Operation	5055952

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation	AN4-13A	4	1,051	0
	AN4-20A	8	170	0
	AN4-5A	4	77	0
	D3195-041	2	1	0
	D3195-043	2	4	0
	D3196-1	1	4	0
	D3196-3	1	4	0
	D3196-4	1	1	0
	D3197-041	2	0	0
	D3198-1	4	14	0
	D3268-1	2	7	0
	D3546-1	2	20	0
	D3551-11	13	48	0
	D412-702-069	1	3	0
	D4387-041	9	5	0
	D4387-043	4	8	0
	D5474-1	6	12	0
	D5475-1	1	8	0
	D5475-2	1	9	0
	MS21042L4	12	2,930	0
	MS24694-S152	8	25	0
	MS24694-S154	8	26	0
	MS24694-S162	6	26	0
	NAS1149D0463J	20	5,719	0

Part Specifications

Specifications could not be found.

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width: 100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐																																																	
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QTY -021	QTY -023	QTY -025	QTY -027	QTY -029	QTY -035	QTY -081	Part Number	Description
X							D412-702-021	Dart 13-Man Shoulder Harness Kit, 4-point
	X						D412-702-023	Dart 5-Man Forward Facing Shoulder Harness Kit, 4-point
		X					D412-702-025	Dart 4-Man Aft Facing Shoulder Harness Kit, 4-point
			X				D412-702-027	Dart 4-Man Side Facing Shoulder Harness Kit, 4-point
				X			D412-702-029	Dart 1-Man Forward Facing Shoulder Harness Kit, 4-point
					X		D214-702-035	Dart 5-Man Aft Facing Shoulder Harness Kit, 4-point, for Bell 214B/B-1
						X	D412-702-081	Dart 2-Man Aft Facing Shoulder Harness Kit, 4-point
1	1		1	1			D412-702-069	GROMMET KIT
2	2						D3195-041	BRACKET
2	2						D3195-043	BRACKET
1	1			1			D3196-1	BAR
1			1				D3196-3	BAR
1			1				D3196-4	BAR
2	2						D3197-041	BAR
4		4				2	D3198-1	FITTING
2	2						D3268-1	PLACARD
9	5		4	1			D3446-041	HARNESS ASSEMBLY, 4 POINT
4		4				2	D3446-043	HARNESS ASSEMBLY, 4 POINT
					5		D3446-045	HARNESS ASSEMBLY, 4 POINT
13	5	4	4	1	5	2	D3551-11	HOOK AND LOOP TIE
2	2						D3546-1	CLIP
4		4				2	AN4-5A	BOLT
4	4						AN4-13A	BOLT
8		8				4	AN4-20A	BOLT
20		20				10	AN960JD416	WASHER (OR NAS1149D0463J)
12		12				6	MS21042L4	NUT (OR MS21042-4)
8	2		6	2			MS24694-S152	SCREW
8	2		6	2			MS24694-S154	SCREW

QTY -069	Part Number	Description
X	D412-702-069	GROMMET KIT
24	D3619-2	GROMMET
1	D3619-2T1	HOLE PUNCH
1	D3619-2T2	STRIKER BLOCK
1	D3619-2T3	PUNCH
1	D3619-2T4	DIE

DART SERVICE INSTRUCTION

TO AMEND IIN-D412-702-1 REV. A,
AND ICA-D412-702 REV. 4 OR EARLIER APPROVED REVISIONS
REF. TCCA STC: SH04-7
REF. FAA STC: SR01997NY
REF. EASA STC: EASA.IM.R.S.00710

PURPOSE

The purpose of this DSI is to outline the replacement of existing D3446-041/-043 Shoulder Harnesses with the new and improved D4387-041/-043 Shoulder Harnesses.

CHANGE

For the following Kits, the D4387-041 and D4387-043 Shoulder Harnesses respectively replace the D3446-041 and D3446-043 Shoulder Harnesses as follows:

Old Harness P/N	Used On	New Harness P/N	Effectivity
D3446-041	D412-702-021	D4387-041	CHG 003 and subsequent
	D412-702-023		CHG 002 and subsequent
	D412-702-027		
	D412-702-029		
D3446-043	D412-702-021	D4387-043	CHG 003 and subsequent
	D412-702-025		CHG 002 and subsequent

Customers who want to upgrade their shoulder harnesses may replace their existing D3446-041/-043 with D4387-041/-043 per this service instruction.

CANADA
DEPARTMENT OF TRANSPORT
AIRCRAFT CERTIFICATION
BRANCH
DAO # 01-O-01

APPROVED

BY: 
D. SHEPHERD (DE # 02)

DATE: 11.05.09
CERT. NO.: SH04-7
ISSUE NO.: 3

A	NEW ISSUE	MB	11.05.09
REV.	DESCRIPTION	BY	DATE
DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. A
MFG. APPR.	N/A	DSI 9559	SHEET 1 OF 1
APPROVED		TITLE	SCALE
DE APPR.		HARNESS CHANGE	NTS
DATE	11.05.09	COPYRIGHT © 2011 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD	

DART SERVICE INSTRUCTION

TO AMEND INSTALLATION INSTRUCTIONS IIN-D412-702-1 REV. A OR LATER
AND INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA-D412-702 REV. 4 OR LATER

REF TCCA STC: SH04-7

REF FAA STC: SR01997NY

REF EASA STC: EASA.IM.R.S.00710

1.0 PURPOSE

The purpose of this Dart Service Instruction (DSI) is to amend section 3.4 of Installation Instructions IIN-D412-702-1 to include the installation of the D5474-1 Spacers and D5475-1/-2 Anti Chafing Shields between the D3196-3/-4 Bars and the aircraft bulkhead. This will allow the D412-702-011/-017/-021/-027 Shoulder Harness Kits to be properly fit in relation to the airframe and to prevent the shoulder harnesses from chafing against protruding fasteners on some airframes.

2.0 INSTALLATION AND MAINTENANCE

IIN-D412-702-1 section 3.4 is amended as follows:

1. Carry out installation instructions IIN-D412-702-1 Rev. A or later up to section 3.4.3.
2. Install the D5475-3/-4 Anti Chafing Shield and Qty (3) D5474-1 Spacers between each D3196-3/-4 Bar and the aircraft structure. Fasten over the OEM thermal blanket to existing aircraft structure using MS24694-S162 Screws. It is acceptable to substitute with longer or shorter MS24694 Screws if required to ensure threads are in in safety. See Figure 1.
3. The D3196-3/-4 Bars and D5475-1/-2 Anti Chafing Shields must be oriented properly to ensure that the holes will align with existing aircraft holes. To pass through the thermal blanket, either cut holes and reinforce the blanket or install D3619-2 Grommets from the D412-702-069 Grommet Kit per Section 4.0 of IIN-D412-702-1. Torque the fasteners per Table 1 of IIN-D412-702-1.
4. It is acceptable to trim the D5474-1 Spacer(s) to provide a better fit.
5. Continue with the installation instructions IIN-D412-702-1 Rev. A at section 3.4.5. Ensure that the harnesses pass between the D3196-3/-4 Bars and the D5475-1/-2 Anti Chafing Shields.
6. Update the aircraft weight and balance per section 3.0 of this service instruction.
7. Update the aircraft logbook to indicate installation of DSI 9766-011 Shoulder Harness Spacer Kit.

3.0 WEIGHT AND BALANCE

Installation	Weight	LATERAL		LONGITUDINAL	
		Arm	Moment	Arm	Moment
DSI 9766-011 Shoulder Harness Spacer Kit	0.78 lb 0.35 kg	0 in 0 m	0 in lb 0 m kg	147 in 3.73 m	114.66 in lb 1.31 m kg

4.0 PARTS LISTS

QTY -011	PART NUMBER	DESCRIPTION
X	DSI 9766-011	SHOULDER HARNESS SPACER KIT
6	D5474-1	SPACER
1	D5475-1	ANTI CHAFING SHIELD
1	D5475-2	ANTI CHAFING SHIELD
6	MS24694-S162	SCREW

CANADA
DEPARTMENT OF TRANSPORT
AIRCRAFT CERTIFICATION
BRANCH
DAO # 01-O-01

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BY: 
D. SHEPHERD (DE # 02)

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